



Interpenetrating polymer networks based on commercial silicone elastomers and ionic networks with high dielectric permittivity and self-healing properties

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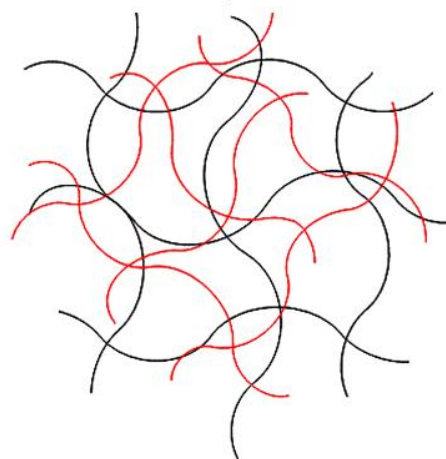
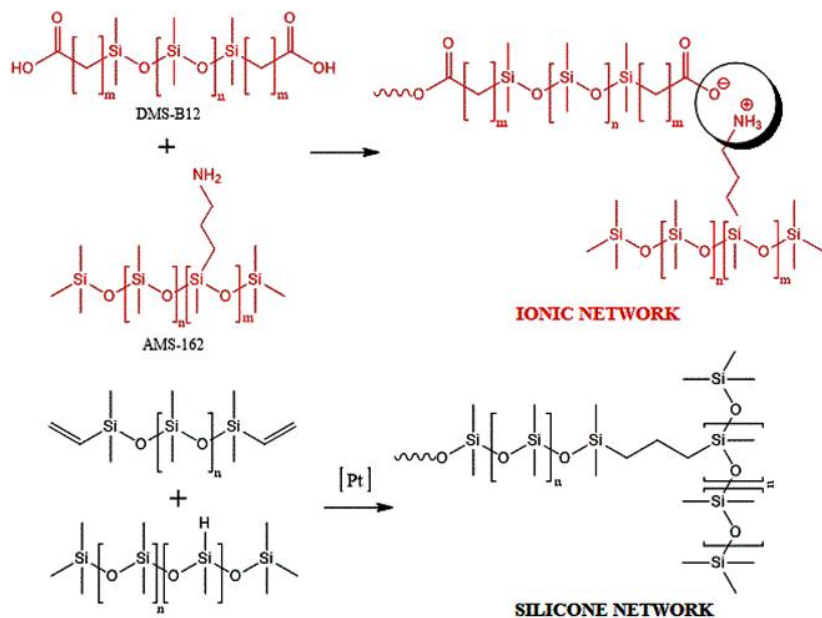
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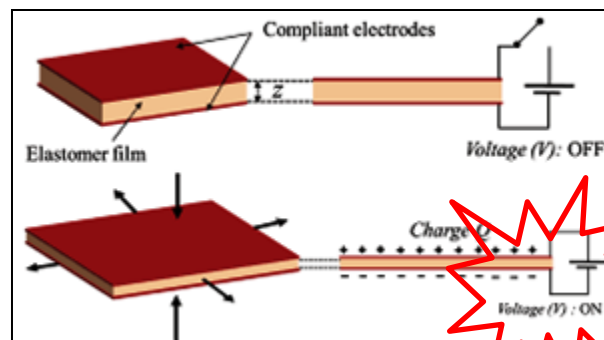
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**IONIC AND SILICONE
INTERPENETRATING NETWORK**



Goal:
↓ **DRIVING VOLTAGE**
↓
Actuation Performance =
↑ ϵ' / Y

IPNs:

Ionically assembled silicone polymers:

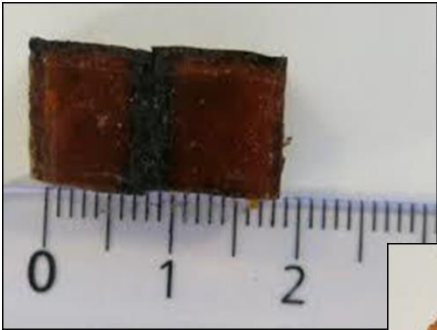
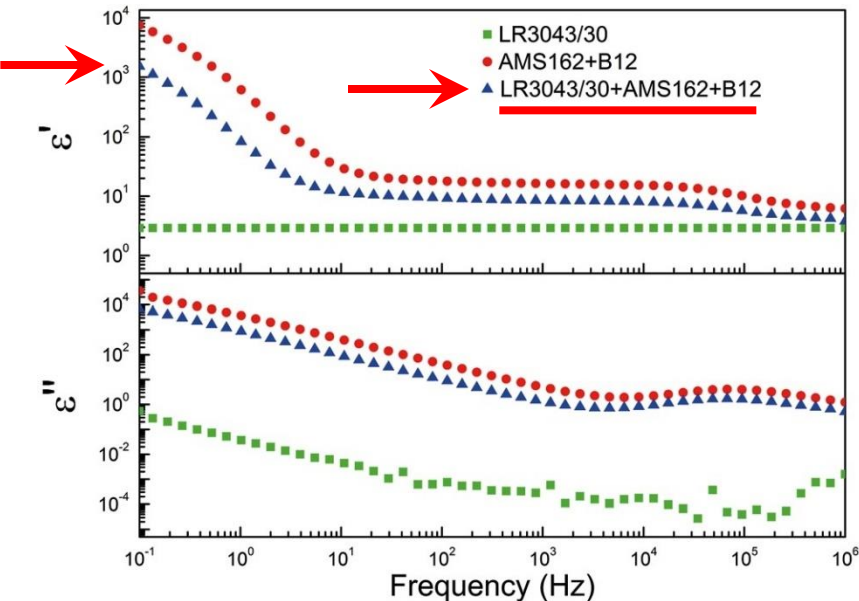
- Softening effect
- Very high dielectric permittivity
- Self-healing properties

+

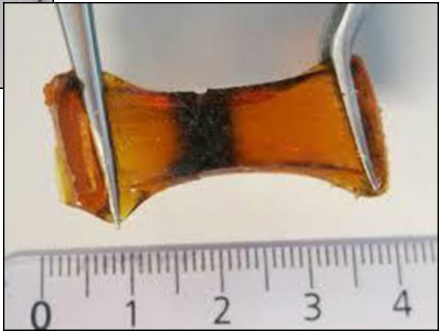
Covalently cross-linked silicones:

- Mechanical integrity
- High breakdown strength

... Overview of the improved properties



More than 100% elongation
of the reassembled samples



INCREASING
IN **LIFE-TIME**
of DEs

| | | $\gamma = 3G' \text{ [kPa]}$ (0,01 Hz) | $\tan \delta_{(rheo)}$ (0,01 Hz) |
|-------------------------------|-----------------|-------------------------------------------|-------------------------------------|
| Pure PDMS | | 64,3 | 0,06 |
| Commercial silicone LR3043/30 | | 252,3 | 0,08 |
| AMS162 + B12 | | 37,3 | 0,01 |
| IPNs LR3043/30 : (AMS162+B12) | 70 wt% : 30 wt% | 255,1 | 0,10 |
| | 50 wt% : 50 wt% | 113,7 | 0,08 |
| | 30 wt% : 70 wt% | 30,9 | 0,05 |
| | 10 wt% : 90 wt% | 30,5 | 0,03 |

... For more informations you can visit my poster

2.2.5

